4004 – CONSTRUCTION-I

Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)			
Lectures	Practical	Credits			Theory		Practical Ex.	Total
3	2	5	25	25	3Hrs.	100	25	175

Pre-requisite	Source	Semester	Theory	Test	Total	TW	PR	Gr Total
Nil	CVL		75	25	100	25	25	150

RATIONALE: -The students are required to know: Construction materials used in different components of buildings. Construction procedure and sequence in detail. Sketch and understand detailed drawings of parts of buildings. Able to explain to workers/mistress on the site with the help of sketches.

COURSE CONTENT	Hrs.	Mks
1. INTRODUCTION	2	6
Inspection of site, studying working drawing, collecting details such as strata available for foundation, levels of site, preliminaries required to start construction. Measuring instruments, instruments for excavation, materials for setting out. Preparation of foundation plan, centreline plan, setting out methods.		
2. FOUNDATIONS	5	10
Definition and purpose. Brief idea about bearing capacity, definition, bearing capacity values of different soils, use of bearing- capacity. Empirical design of shallow foundation, spread footing for walls. Different loads coming on foundations and column footings. Difference between load bearing structure and framed structure.		
3. CONCRETE	1	6
Definition, composition, ingredients, uses of concrete. Grades of concrete for different use. Merits of concrete over other materials.		
4. STONE MASONRY	6	10
Characteristics of good building stones. Common stones used in construction of walls, foundations, cladding. Construction of stone walls and foundations. Terms used such as facing, backing, hearing, header, stretcher, lapping. Bonds in stone masonry. Types of stone masonry – Un-coursed rubble, coursed rubble, ashler, random rubble and dry stone masonry.		
5. BRICK MASONRY	8	12
Requirements/characteristics of good building bricks. Classification of bricks. Terms such as bed, frog, stretcher, header, course, bond and its importance. Laying of bricks, soaking, mortar joints, checking the level and plumb, scaffolds, raking of joints, curing, mortar mixes to be used. Features of Flemish bond and English bond and their suitability, other bonds. Half brick thick partition walls, foundations for partitions, reinforcing the brick partition walls with R.C.C. bonds. Opening in brickwork spanned by lintels and arches. Points to be observed in construction of good brickwork.		
6. DOORS AND WINDOWS	5	10
Doors – functions, locations, standard sizes, frame sizes, shutters such as battened and ledged, battened ledged and braced, panelled, flush, fixing the shutter with frame, opening direction and hinge position, glazed ventilators to doors, other types of doors such as steel, collapsible, rolling, P. V. C. doors, door fixtures. Windows- Frame sizes, common sizes of windows glazed shutters, sash windows, glazed louvers, top hung, bottom hung and middle pivoted ventilators, steel and aluminium windows, grills and fixtures for windows, use of synthetic materials.		

7. ROOFS Pitched roof and flat roof, suitability and comparison. Terms used in pitched roof such as ridge, eaves, hip, gable, etc. Types of pitched roofs such as lean-to roof, couple, couple closed, collar, king post and queen post trussed roofs, steel trusses. Roof covering – Mangalore tiles, asbestos cement sheets, G.I. sheets and connections, laying procedure. Drainage of pitched roofs.	5	12
8. FLOORS AND FLOOR FINISHES Ground Floors-Requirements of a good floor, plinth filling, rubble packing (soling), base concrete. Upper floors-Single and double timber floors, jack arch, double flag stone, R.C.C. floor. Mezzanine – Location, requirements and uses. Floor finishes - Murum flooring, I.P.S. flooring, red oxide flooring, Mosaic and Terrazo flooring, granite stone flooring, shahabad flooring , black cuddapah, marble, brick flooring , construction details. White and coloured glazed flooring, skirting and daddoing	5	12
9. STAIRS Function, location, common terms such as pitch, nosing, tread, riser, landing, handrail, balusters, newel post, soffit, headroom. Requirements of good stair, thumb rules for geometrical design of stair, common dimensions of stair in residential and commercial buildings. Types of stairs based on –Geometrical shape, material: timber, steel, concrete. Supporting conditions such as s/s, cantilever. Finishes of nosing, balusters and newel-post.	5	10
10. FINISHING WORKS Plastering mortars for plastering, preparation of surfaces for plastering, scaffolds for internal and external plaster, plastering operation. Plaster finishes: Internal surfaces, external surfaces, sand faced plaster, rough cast plaster, pebble dash, wrinkled, neeru finish, precautionary measures to avoid cracks in plaster. Pointing-Necessity of pointing the stone and brick masonry, flush pointing, raked pointing, weathered pointing, recessed pointing. Painting- Preparation of surface for new and old painting with oil paints, white wash and colour wash, distempering and cement paints.	6	12
Total	48	100

Note Term works mentioned may be actually performed or demonstrated or students may be t[illegible]n for site visits. Each term work should be presented in sketches and description.

PRACTICAL

Setting out of building drawn in Civil Engineering Drawing-II. Construction of brick-work at right angled corner in English bond and in Flemish bond, each one brick thick and 1½ brick thick. Construction of "T" junction in brickwork; Construction of single brick column in brickwork. Casting cement concrete floor. Form work of R.C.C. beam, slab and columns. Construction method of stone masonry wall. Scaffolding for walls. Plaster finishes and procedure. Detailed sketch of King post roof truss. queen post roof-truss with all components. Details of lean-to-roof, pitched roofs showing the positions of trusses, purlins, ridge, common rafter, etc.

REFERENCE BOOKS

1. Building Construction by Sushil Kumar
2. Building Construction by Krishnamurthy
3. Building Construction by Rangwala
4. Building Construction by Mitchell
5. Building drawing by Malik
6. Building Construction by S. Ramamruthan.